

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) An optical wavelength division multiplexer/demultiplexer device comprising a substrate having a plurality of wavelength selecting filters, said filters being arranged to provide conversion between a combined beam comprising a plurality of wavelength channels and a plurality of separate beams each comprising a subset of said plurality of wavelength channels, ~~characterised in that~~wherein hollow core waveguides are formed in said substrate to guide light between the wavelength selecting filters.
2. (original) A device according to claim 1 wherein each of said plurality of wavelength selecting filters transmit a single wavelength channel.
3. (currently amended) A device according to ~~any preceding claim 1~~ wherein the wavelength selecting filters comprise thin film optical filters.
4. (currently amended) A device according to ~~any preceding claim 1~~ wherein the substrate additionally comprises a plurality of alignment slots arranged to receive, in alignment, said optical filters.

5. (original) A device according to claim 4 wherein said alignment slots comprise micro-electro-mechanical system (MEMS) structures to provide said alignment.

6. (currently amended) A device according to ~~any preceding claim 1~~ wherein the substrate comprises at least one of a semiconductor material, silicon, silicon-on-insulator (SOI) and a silicon oxide based material.

7-11. (cancelled)

12. (currently amended) A device according to ~~any preceding claim 1~~ wherein a base portion and a lid portion are provided to define said hollow core waveguide.

13. (currently amended) A device according to ~~any preceding claim 1~~ wherein at least one further hollow core waveguide is provided in the substrate to guide said combined beam and/or said plurality of separate beams each comprising a subset of said plurality of wavelength channels to/from said plurality of wavelength selecting filters.

14. (original) A device according to claim 13 wherein at least one optical fibre alignment slot is provided in said substrate, said optical fibre alignment slot being arranged to receive an optical fibre in alignment thereby enabling light to be coupled between said optical fibre and said at least one further hollow core waveguide.

15. (currently amended) A device according to claims 14 wherein a mode ~~matching~~
~~means~~matcher is provided to couple light between the at least one optical fibre and the
at least one further hollow core waveguide.

16. (currently amended) A device according to claim 15 wherein the mode ~~matching~~
~~means~~matcher comprises at least ~~any~~ one of a ball lens ~~and/or~~ a GRIN lens.

17. (currently amended) A device according to ~~any preceding claim~~ 1 wherein at least
one of the hollow core waveguides comprise at least one ~~or more~~ reflective
~~element~~element.

18. (cancelled)

19. (currently amended) A device according to ~~any preceding claim~~ 1 wherein the
hollow core waveguides are dimensioned to support fundamental mode propagation.

20. (cancelled)

21. (currently amended) A device according to claim 20 1 wherein the hollow core waveguides are dimensioned to support multi-mode propagation and said wavelength selecting filters are spaced apart by the re-imaging distance.

22. (currently amended) A device according to ~~any preceding claim~~ 1 wherein said hollow core waveguides have a substantially rectangular cross section.

23. (currently amended) A device according to ~~any preceding claim~~ 1 wherein the combined beam comprises at least ~~three or more~~ wavelength channels.

24. (currently amended) An optical device comprising a demultiplexer stage comprising first and second devices ~~a device according to any preceding claim 1~~ , wherein said first device ~~that~~ is arranged to receive a combined beam comprising a plurality of wavelength channels and to separate said combined beam into a plurality of beams each comprising a subset of said plurality of wavelength channels, and a multiplexer stage, wherein said ~~comprising a second device according to any preceding claim~~ that is arranged to receive a plurality of beams each comprising a subset of said plurality of wavelength channels and to combine said plurality of beams to produce a combined beam comprising a plurality of wavelength channels, wherein at least ~~one or more~~ of the plurality of beams produced by the demultiplexer stage are routed to the multiplexer stage via an optical ~~processing means~~ processor.

25. (currently amended) A device according to claim 24 wherein the optical processing means ~~comprise~~processor comprises at least one of an optical amplifier and a matrix switch.

26. (cancelled)

27. (currently amended) A device according to claim 17 wherein the optical processor comprises a matrix switch and at least one~~26 wherein one or more additional wavelength channels are~~channel is received by said optical routing means~~matrix switch,~~ said ~~optical routing means~~matrix switch being arranged to route at least some of said at least one additional wavelength channels~~channel~~ to said multiplexer stage.

28-29. (cancelled)

30. (original) A substrate for an optical wavelength division multiplexer/demultiplexer device comprising a plurality of alignment slots for receiving a plurality of wavelength selecting filters and hollow core waveguides to guide light between said alignment slots wherein the arrangement provides, when appropriate wavelength selecting filters are located in said alignment slots, conversion between a combined beam comprising a plurality of wavelength channels and a plurality of beams comprising a single wavelength channel.

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31-32. (cancelled)